



#### 4.1 Soils

#### Area A

Priority pollutant heavy metals were the most significant contaminants in all three soil samples (M1188, M1189 and M1198) in Area A. Samples M1188 and M1189 had levels of cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg) and zinc (zn) all exceeding BISE cleanup levels (Cr in sample M1188 was 99 mg/kg which is 1 mg/kg below the cleanup level). Sample M1198 had only excessive levels of lead with all other priority pollutant metals below cleanup levels.

The source of these metals may be from the impurities in the reconditioned steel drums which are removed during the incineration process. The ash from the incineration concentrates these metals which can then be leached. Other sources can be from the drum reconditioning building and overflows from the oil/water trench which also contains metal from the incinerator leachate. The levels found in LB&A's investigation are lower than those detected by the USEPA analysis of the ash pile and soils near the incinerator but consistent with those findings (see Appendix A). Where metal concentration in ash and incinerator soil was in the hundreds to thousands (mg/Kg) the soil near the settling and holding tanks was in the tens to hundreds (mg/kg) range.

Area A had surficial soils (0-24") with excessive levels of organic contaminants. The organics in high concentration were polycyclic aromatic hydrocarbons (PAHs) and phthalates from the base/neutral extraction group. The total concentration of all priority pollutant base/neutral organics exceeded 110 mg/kg (see Table 5), with the phthalates comprising over 85% of the total. When additional peaks of the non-priority pollutants are figured in the total, the diversity of organic compounds increases to include other aliphatic and monocyclic aromatic hydrocarbons besides phthalates. In sample M1188, alkanes, a group of aliphatic hydrocarbons registered at over 76 mg/kg, while total monocyclic aromatic hydrocarbons which includes the tri and dimethyl benzenes exceeded 58 mg/kg. Both of these classes of chemicals were conspicuously absent in sample M1189 which is only 30 feet south of M1188. Sample M1198, taken from the first two. feet of soil of monitoring well #3, also had low levels of nonpriority pollutants, except for alkanes, which were over 2.6 mg/kg. (Note: Results of non-priority pollutants are semiquantitative and useful only in indicating their presence and general level of concentration.)

There are no BISE criteria for cleanup levels of base/neutral extractables in soil, but polycyclic aromatic hydrocarbons are either known or suspected carcinogens and are included in the range of constituents found in sample M1188. There were no other excessive levels of contaminants in any of the soil samples in Area A, except for PCB's in sample M1188, at a concentration of 19.1 mg/kg. The BISE cleanup criteria for PCB's in soils is 1-5 mg/kg while USEPA does not regulate PCBs with a concentration of less than 50 mg/kg.

### TABLE 5 SUMMARY OF AREA A CHEMICAL ANALYSIS RESULTS

Sample #	M1188	M1189	M1198	M1213	M1214	M1215
Units	ug/kg	ug/kg	ug/kg		ug/kg	ug/l
Date of Submission		25-Apr		26-Apr	26-Apr	27-May
Depth	C-18"	Ç-18"	C-2'			
Composite/Discrete	D	D	D	С	C	D
Soil (S)/Water (W)/Sediment (X)	S	S	s .	x	x	W
VOLATILE ORGANICS		_				
PRIORITY POLLUTANTS						<del></del>
Benzene	ND	ND	ND	NA.	NA.	מא
cis-1,3-Dichloropropylene	ND	ND	ND	NA	NA	ND
Ethylpenzene	28.10	J2 ND	UJ1 ND	UJ1 NA	NA	ND UJ2
Methylene chloride	158	ND ND	DN LO	NA NA	NA	אם סטצ
Tetrachloroethylene	ND	ND	ND	NA	NA	ND
Toluene	33	2	ND	NA	NA	ND
Totals	219.1	2	0	NA	NA	0
ADDITIONAL PEAKS (SEMI-QUANTITATIVE)				,		
2-Methyl hexane	ЙD	ND	ND	NA	NA	ND
2-Pentanone, 4-Methyl	ΝD	ND	ND	NA	NA	ND
2-Propanones	ND	ND	ND	NA	NA	ND
3-methyl benzene	ND	ND	ND	NA	NA	ND
3-Methyl pentane	ND	ND	ND	NA	NA	ND
4-Ethyl 2-Pentanone	ND	ND	ND	NA	NA	ND
4-Methyl 2-Pentanones	ND	ND	ND	NA	NA	ND
Acetone	ND	ND	ND	NA.	NA	ND
Alkanes	50	ND	, MD	NA	NA	ND.
Alkyl benzene	ND	ND	ND	.NA	NA.	ND
Benzene ethenyl-methyl	<b>1</b> 00	ND	MD	`NA	NA	ND
Benzene, 1,2,3-trimethyl	ND.	50	ND	NA	NA	ND
Cycloneptane, methyl	89	ND	ND	NA.	NA	1870
Cyclohexanes, 1,1,3-trimethyl	ХD	ND	ND	NA	AM.	ND
Cyclonexame, 1,1-dimethyl	76	ND	ND	NA	NA.	720
Cyclohexane, 1,3-dimethyl	64	ND	ND	NA	NA.	ND
Cyclohexanes, 1,3-dimethyl, cis	120	723	120	NA	N7.	700
Cyclohexames, 1,3-dimethyl, rrans	120	1820	723	<b>17</b> 0.	<b> </b>	i S
Cyclohexane, 1, 1, 3-trimethyl	_ <b>K</b>	720	720	.54	127	<b>122</b>
Cyclonexane, 1, 2-dimethyl, cis	120	720	<b>23</b>	774	15%	<b>12</b> 0
Cyclohexane, 1, 2-cimethy1, trans	, <u>, , , , , , , , , , , , , , , , , , </u>	720	720	157.	724	100
Cyclonexane, 1, 3-dimethyl, trans	100	720	120	NA.	NA.	ND
Cyclonexane, 1, 4-dimethyl, cis Cyclonexane, 1-ethyl-4-methyl cis	720	72	120	X7.	72	120
Cyclonexame, 1 - emyl-4-memyl cus	70	) )	<u> </u>	<i>1</i> 24	72	22
Cyclonexamone, 1.3.5-marmyl	23 23	72 23	<u>2</u> 2	72. 22.	72	150 150
Cyclooctane, butyl	176	<b>1</b> 20	10	27. 24.	57. 574	** PE
Cyclopestane, methyl	72	725 200	22 23	NA NA		
Cyclopestane, 1, 3-timetry1, trans	X	)   	120 120	NA.	15. 15.	20 20
Dimethyl benzenes	<b>1</b> 20	<u> </u>	8D	22.	NA.	<b>2</b>

J2= Estimated concentration due to MRDS for response factor in inital calibration nigner than 3C2
ND = Not Detectable
UJ1 = Estimated quantitation limit 13ug/kg
UJ2 = Estimated quantitation limit 16.3ug/l

NA = Not analyzed for this parameter

Sample #	M1188	M1189	K1198	41212		
	117 100	WITTON		M1213	M1214	M1215
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/l
Date of Submission	25-Apr	25-Apr	05-May	26-Apr	26-Apr	27-May
Depth	0-10	0-10	. 0-2		_	_
Composite/Discrete	D	D	D	C.	С	D
Soil (S)/Water (W)/Sediment (X)	. S	S	<b>S</b>	X	X.	W
VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-OUA	NTITATIVE	) CONT	NUED	<del></del>		
dimethyl cyclohexane	.ND	ND	ND	NA	NA	ND
Dimethyl cyclopentane	ND	ND	ND	NA	NA	, ND
Dimethyl-3-hexene	ND	ND	ND	NA	NA	ND
Ethane, 1,1'-oxybis	. ND	ND	ND	NA	AM	ND
Ethyl-methyl benzene	ND	ND	ND	NA.	NA	ND
Heptane, methyl	ND	ND	ND	NA	NA	ND
Hydrocarbons	ND	ND	ND	NA	ŇA	ND
Methyl cyclonexane	ND	MD	ND	NA	NA	ND
m-Xylenes	ND.	ND	ND	NA	NA	1.D
OLD-Xylenes	ND	ND	ND	NA	NA	, ND
Pentane, 3-methyl	ND	ND	ďΩ	NA	NA	ND
Pentanes, methyl	ИĎ	ЙD	ND	NA.	NA.	ND
Propyl benzene	ND	ND	ND	NA	NA	ИD
Xylenes	ND	, ND	ND	NA	NA	ĽΦ
ACID EXTRACTABLES	·			=	·	
PRIORITY POLLUTANTS						
2-Chlorophenol	МD	ИD	ND	MD.	ND	ND
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	230	KD	ND	ND	ND	21.9
Pentachlorophenol	ND	ND	ND	ND	ďχ	
Pnenol	210	ND	ND	708	360	NTD.
2.4.6-Trichlorophenol	7/10	ND	720	ND	. 100	ND
Totals	440	. 0	0	708	360	21.9
BASE/NEUTRAL EXTRACTABLES						
PRIORITY POLLUTANTS			•			
Acenaphthene	ND	ND		ND	770	
Acenaphthylene	ND	ΝD		ND	ND	
Anthracene	510	ИD		ND	MД	
benzo(a)anthracene	KD	ND		ND	. 100	
Benzo(a) pyrene	1,100	ND		ND	MD.	
Benzo(b) fluoranthene	2,000	ND		KD	342	
Benzo(ghi)perylene	ign Git	ND		CX.	CM.	
bis(2-Ethylhexyl)phthalate		44,600		206,000		
				/7 EDA	5,400	I NI
Eutyl penzyl phthalate Chrysene	1,200 MD	ND ND		47,600 ND	3,400 Ke	

	•					
	M1188	M1189	M1196	M1213	M1214	M1215
Sample #	ug/kg	ug/kg	ug/kg	ug/ka	ug/kg	ug/1
Units		25-Apr		26-Apr	26-Apr	27-May
Date of Submission	0-18"	0-18"	0-2			· .
Depth	0-10 D	D	מ	С	.c	D
Composite/Discrete	S	Š	. s	x	x	W
Soil (S)/Water (W)/Sediment (X)						
BASE/NEUTRAL EXTRACTABLES, PRIORITY POLLUTANT	rs contin	TUED	.,			
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	иD
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND DN
Diethyl phthalate	ND	ND	ND	19,900	ND	
Dimethyl phthalate	ND	ND	ИD	ND	ND	ND
Di-n-butyl phthalate	ND	ŃĎ	420	48,000	4,600	ND
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ИD
Di-n-octyl phthalate	, ND	ND	ND	3,700	ND	13D
	2,800	ΝD	<b>BMDL</b>	2,090	1,500	ND
Fluoranthene	ND	ND	KD	ИD	ND	ND
Fluorene	ND	ND	ďΖ	ИĎ	ND	ND
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	ND	ND	ND
Isophorone	2,000	ND	BMDL	860	4,200	ND
Naphthalene	ND	ND	3,210	1,570	ND	ND
N-Nitrosodiphenylamine	2,200	ND	BMDL	3,500	3,100	MD
Phenanthrene	4,100		BMDL	2,130	1,200	13D
Pyrene	ND			ND	ND	8.24
1,2,4-Trichlorobenzene					104 000	10.54
Totals					134,000	10.54
BASE/NEUTRAL/ACID EXTRACTABLES, ADDITIONAL F	PEAKS (SE	MI-QUAN	TITATIV	E)		
1H-Indene octahydro 2,2,4,4,7,7-hexamethyl	6,560			ND	ND	ND ND
lH-Benzo(b) fluorene	N			ND		
1H-Indene, 2, 3-dinyaro	N			ND	ND	ND
18-Inden-5-ol, 2, 3-dihydro	NI.			720		ND
1.1'-Biphenyl	N			ŒΜ		ХD
1,2,3,4-Terramethyl benzene	5,410			_		
1.2.3-Trimethyl benzene	N		-			
1-Methyl anthracene	10	-				
2,6-Dimethyl nonane	N					
2-Ethyl nexamoic	N		-			
2-Ethyl maphthalene	N					
2-nydroxy benzaldehyde	, N	-				
2-methyl 1,1'-biphenyl	K		-			
2-Methyl anthracenes	72	_				
2-Methyl naphthalene	N					
Z-Methyl pnenanthrene	72	_	_			כא
2-metnyl phenol	K	_	_			
2-Propendic acid, 2-Methyl, Dodecyl ester	N	מ כ	D MI	3,634	. Ni	) <u>1</u> 20

Sample # Units Date of Submission Depth Composite/Discrete	M1188 ug/kg 25-Apr G-18"	M1189 ug/kg 25-Apr 0-18" D	M1198 ug/kg 05-May G-2	M1213 ug/kg 26-Apr	M1214 ug/kg 26-Apr	ם
Soil (S)/Water (W)/Sediment (X)	S	S	S	X	. <b>X</b>	W
BASE/NEUTRAL/ACID EXTRACTIBLES, ADDITIONAL PE	AKS (SEM	FIAUO-II	TITATIVE	) CONTIN	UED	
3-Ethyl-2-Methyl heptane	ND	ND	ND	DИ	ND	ND
3-Methyl phenanthrene	ND	ND	ND	ND	ND	ND
3-Methyl phenol	ND	ND	ND	ND	ND	ND
4-Methyl phenanthrene	ND	ND	ND	ND	ND	ND ND
4-Methyl phenois	MD.	ND	MD CON	ND ND	ND 54,924	ND
Alkanes	76,390		. 2,668	20,114 ND	ND	ND ND
Benzenesulfonamide, 4-methyl	ND ND	ND ND	ND	ND ND	ND	ND
Bicyclo(3,2,1)oct-2-ene,3-methyl-4-methylene	<b>120</b>	ND	ND	ND	ND	ND
Cyclonexane, pentyl	ND	ND	ΝD	ND	ND	ND
Diethyl benzene	ND	2,120	ND	ND	ND	ND
Dimethyl 2-pentenes Dimethyl ethyl phenol	ND	ND	ND	ND	ND	ND
Dimethyl beptane	NT)	130	ND	ND	ND	ND
Dimethyl naphthalenes	ND	ND	ND	ND	ND	ND
Dimethyl pentenes	ND	ND	ND	ND	ND	ND
Dimethyl phenanthrenes	ND.	ND	KD	ND	ND	ND
Dimethyl phenols	ND	ND	ND	ND	ИD	ND
Dimethyl-ethyl benzenes	720	ND.	396	ŃD	ND	ND
Dimethyl-ethyl phenol	ND	ND		ND	ИD	ND
Ethanone, 1-(4-ethyl phenyl)-ethyl	ND	ND		ND	ИD	ND
Ethyl benzenes	ND	ND		ИD	ИD	ND
Ethyl methyl benzene	ND	ZZ		ИD	מא	ND
Ethyl naphthalene	720	7.70		ND.	ND	ND
Ethyl phenois	ĭ.D	ND		MD.	ND.	ND ND
Ethyl- methyl benzenes	ND			ZZ	ND ND	
Ethyl-1.2.3-trimethyl benzene	200	720		ND ND	KD KD	
Ethyl-1,2,4-trimethyl benzene	8,920 9,640			ND ND	ZZ/	
Ethyl-dimethyl benzenes	4,840			ND	ND	
Ethyl-methyl benzenes Ethyl-methyl phenols	7, 540 XD			ND	ND	
Emyl-propyl benzene	NZD NZD			ND	137	
hexadecanoic acid	120			Œ.	16,062	
Hexanal	150			ND	11,010	ND.
Hydroxy benzaldehyde	120	NI NI	(T)	4,628	ND	ND
Methoxy benzaldenyde	Z	NI	QZ,	ND.	ND	MD MD
Methyl benzenes	. <i>N</i> D	NE	721	3,939	9,400	, <b>Q</b> 24
Methyl ethyl benzene	ND	NI	i i i	ND	NE	
Methyl Fluorenes	N)			ND	NE	
Methyl naphthalene	N			ZZ	NI	
Methyl phenanthrene	NE			120	K	
Methyl phenols	320			ND	NE	
Methyl-ethyl benzene	100	77		ND	KI	C2 (2)

### SUMMARY OF AREA A CHEMICAL ARALYSIS RESULTS

	,					
·	M1186	M1189	M1196	M1213	1:1214	M1215
Sample *	ug/kg	·ug/kg	ug/Kg	ug/Kg	ug/ĸç	ug/l
Units	25-Apr	25-Apr	05-may	26-Apr	26-Apr	27-May
Date of Submission	0-18"	0-1E"	(-2 <sup>-</sup>	•		
Depth	ם	D	D	ε	°C	D
Composite/Discrete	Š	Š	Š	X	X	W
Composite/District Soil (S)/Water (W)/Sediment (X)						
BASE/NEUTRAL/ACID EXTRACTIBLES, ADDITIONAL	L PEAKS (SEM	I-OUANT	ITATIVE	) CONTIN	UED	
hanols	ND	ND	ND	ND	ND	ND
Methyl-ethyl phenols Methyl-methyl ethyl phenols	ND	RD	ND	ND	ND	ND
Methyl-methyl-ethyl benzenes	7.290	ND	€27	ND	ND	ND
Methyl-metnyl-ethyl bentenes	ND	KD	ND	ND	ND	ND
Methyl-naphthalene	ND	ND	ND	ND	ND	KD
methyl-propyl benzenes	ND	КD	КD	ND	ND	ND
Naphthalene, decahydro, trans	ND	ND	ND	8,490	ND	IID
N-propyl benzamide				ספר, ס	- KD	ND.
Phosphoric acid, triphenyl ester	ND	ND ND	ND ND	ND	KD KD	ND ND
Propyl benzenes	ND				•	
Tetrachlorobiphenyls	ND	ND	ND	ND	ND	ND
Testadecanoic acid	ND	ND	ND	1,229	ND.	ND
Te-ramethyl benzenes	ND	ND	ND	ND	_ ND	ЙD
Terramethyl butyl phenols	5,090	2,480	335	ND	ND	ND
Trichlonethene	ND	КD	ND	ND	ИD	ŅD
Trimethyl benzenes	ND	ND	ND	ND	ND	KD
Trimethyl naphthalenes	4,950	ND	ND	ND	ND	ND
Trimethyl phenols	ND	ND	ND	ND	ND	ND
	5,580	ND	386	ND	ND	ND
Xylenes						
PCB						
PRIORITY POLLUTANTS				<u> </u>		
Aroclor 1242	4,100	11 2.200	1 ND	מא אד	ND	
Aroclor 1254	15,000	772,200	* 3,600 ·	11 ND	ND	ממ
	10 100	J1 <sub>2,200</sub> J	1	31 o	0	٥
Totals	19,100	2,200	3,600			J
METALS	<del></del>	<del></del>	<del></del>			
UNITS ·	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/2
PRIORITY POLLUTARTS					•	
Antimony	<u> </u>	0.90	1.10	3.50	4.10	
Arsenic	€.20	5.20	3.60	5.60	27.00	C74
Bervllium	2.30	C. 09	k)	C.48	C.32	N.D
Cade	11	24	100	100	16	
Chromium	99	170	22	215	120	12.00
Copper	550	233	1.15	223	530	
Leac	980	790	330	97C	725	,
Heren	1.20	2.5C	230 2.44	570	1.00	
SETELIV		1.		33		
				e c	7.5	1 2
Nickel Selenium	64 100	54 872	KD C.41	69 373	76 200	

DI = Estimated Concentration. Samples were reextracted past holding time limits as specified in 40CFF part 136

Phenolics, Total Cyanide, Total	1.00 1.40				`	0.06 <.025
PHENOLICS & CYANIDE	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L
Totals	0	0	0	389 <sup>J</sup>	1 324 <sup>)</sup>	1 o
Endrin aldehyde	ND	ИD	ND	65	ם אם	ND
Endosulfan sulfate	MD	ND		160 3	1 34 <sup>J</sup>	
4,4'-DDE 4,4'-DDD	ND				160	, ND
Beta-BEC	ND ND	ND ND		140 J	I ир I 130ј 160,	ם או
PRIORITY POLLUTANTS	ND	ND	ND	24 J	1 ND	ND
PESTICIDES UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/L
Totals	4,221	2,005	339	2,978	4,466	114
Zinc	2,470	/15	2.20	1,340	2,370	71.00
Silver Thallium	0.48	0.76 718	ND 2.20	0.39 1.340	0.16 2,970	ND 71.00
UNITS	2.80	2.70	מא	2.90	1.50	2.00
METALS, PRIORITY POLLUTANTS CONTINUED	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
Composite/Discrete Soil (S)/Water (W)/Sediment (X)	S	S	S	X	X	¥
)enth	מ	D	D		c	. •
Date of Submission	25-Apr 0-185	25-Apr 0-18"	05-May	26-Apr	26-Apr	2 /-may
laits	ug/kc	ug/kç	ug/kg	ug/Kg	ug/kc	ug/1
Sample *	#1188	M1189	M1198	M1213	M1214	M1215

JI = Estimated concentration. Samples were reextracted past holding time limits as specified in 40CRF part 136

#### Sediment

Two buildings within area A were sampled for total priority pollutants plus 40 by taking sediment samples in 5 different locations of each building. The 5 sediment samples were then composited for analyses.

The composite samples from the drum reconditioning building and the boiler rooms (M1213 and M1214) also reflected high heavy metal concentrations that exceeded BISE cleanup levels for Cd, Cr, Cu, Pb, Hg and Zn. These parameters are the same metals found in the two soil samples near the 5,000 gallons settling tank and oil/water trench. Considering the high levels of heavy metals found in the soils it was not surprising to find equally high metal concentrations in the drum reconditioning building. The use of this building made it susceptible to concentration in the floor drain from the effluent produced in chemical cleaning of the drums. But the degree of contamination found in the boiler room was unexpected and indicated flagrant contamination of structures not used in operations that would be the obvious sources of contamination. One possible explanation may be that given the age of the facility (original buildings dating back to 1931 - See Section 2.4 and Figure 2), the use of buildings has changed to its present use from one that may have caused the contamination.

Regardless of sources, the heavy metals contamination is prevalent in both the soils and buildings at levels that exceed cleanup levels and indicates widespread contamination.

Sample M1213, from the floor drain of the Closed Head Reconditioning Building, had excessive concentrations of the same organic constituents found in soil sample M1188: phthalates, alkanes and lesser amounts of PAH's. Total priority pollutant base/neutral organics exceeded 300 mg/kg. The phthalates were much higher in the floor drain sample than in the soil of Area A, with bis (2-ethylhexyl)phthalate exceeding 200 mg/kg.

The presence of pesticides in both buildings is to be noted.

The Boiler Rooms (Sample M1214) had sediment samples taken off of their floors and walls. Though similar in constituency to the floor drain sample concentrations, total priority pollutant base/neutral organics made-up only 134 mg/kg, with phthalates being the primary constituent. Conversely, alkane concentration exceeded 54 mg/kg, as compared to 20 mg/kg for sample M1213. The pesticide concentrations were similar to those found in the floor drain samples.

See Table 5 and Figure 4 for summary analytical results and location of excessive concentration levels, respectively.

#### Area B

Soils in Area B had a wide variety of contaminants from heavy metals and all organic groups, some of which exceeded the BISE cleanup levels. Area B covers the largest areal extent of the sampling program and receives runoff from the drum storage area and the tire pile, and overlays the storm sewer system. This makes it susceptible to various sources of contamination.

## TABLE 6 SUMMARY OF AREA B CHEMICAL ANGLYSIS PESUIDS

	*							
Samble #	<u> 91190</u>	M1191	M1192	M2193	M1196	M1197	M1209	W 245
Units	uc/kc	UG/KC	uc/KE	ug/xc	us/ke			*1242
Date of Submission	25-Apr			3 2-7-2-2 23 1-7-2-	25-4-	26-AD:	ug/Kc	ug/kc
Depth	(-12"	16-36"	(-1E"	16-36"	(-18°	16-36"		26-Ap:
Composite/Discrete	Ď	Ð	ם	2	t-10 D	••	(-15.	_
Soil (S)/Water (W)/Sediment (X)	Š	Š	Š	S	S		S	5
VOLATILE ORGANICS							<del></del>	<u>S</u>
	_							
PRIORITY POLLUTARTS Benzene	-							
	22,000	31,100	72	2.6	BMD"	ND	15h	237
C15-1,3-Dichloropropylene	120	, 12D	133	120	120	150	1GA	120
Ethylbenzene	243,000	40E.000	ງ3 <sup>5.83</sup> ເຕ	:13 12	4.5	ນນ5 <sup>23.9</sup> ນນ5 <sup>33.9</sup> ນ	. 155	120
Metnylene chloride	48.800 J	3 91.600,	150,	(CM C.)	ເນ4 4.5 ກັກ	עט אבטע	J6 13A	25.9
Tetrachloroethylene	120	1770	KD	i ND	120	130	NA	120
Toluene	265,000	321,000	KD	ಬಾ	. 150	15.4	NA.	120
Totals	576,800	251,700	5.83	1.6	4.5	49.3	NJ.	322.9
ADDITIONAL PEAKS (SEMI-QUANTITATIVE)								•
2-Methyl hexane	120	KD.	<b>12D</b>	ND	1/20	· 123		
2-Pentanone, 4-Methyl	NE	150	720	120	ND ND		120	120
2-Propanones	120	120	8			120	ND.	1/20
3-methyl benzene	70D	120	720	30	6	32	1/20	120
3-Methyl pentane	69,000	72D	<b>621</b>	123	120	120	723	320
4-Ethvl 2-Fentanone	ND	12D		Œ	720	120	ND	, <b>1</b> 2D
4-Methyl 2-Pentanones	. 100	720	72D	120	720	120	MD	1/20
ACETORE	. 20	120	. 170	ND	ND.	120	N <sub>D</sub>	720
Alkanes	ND ND	723	120	120	120	120	123	120
Alkyl benzene	720	720	12D	120	120	120	ZZ.	<b>Z</b> D
Senzene ethenyl-methyl	120	720	12D	727	720	720	ND	MD
Benzene, 1,2,3-tramethyl	. 150	720	<b>220</b>	120	22D	.7	120	<b>1</b> 220
Cyclonestane, methyl	. 120	720	1370	12D		720	130	7/20
Cyclonexanes, 1,1,3-trimethyl	120	120	17	20	150	120	700	. 170
Cyclonexame, 1,1-dimethyl	) X2D	150	150		120	- 720	120	720
Cyclonexene, 1,3-cimethyl	700 CZi	123 123		120	120	120	720	122
Cyclonexanes, 1,5-dimethyl, cis	720	<b>123</b>	120	750	720	120	123	120
Cycloheranes, 1,3-dimethyl, trans	) NO		10	120	720	723	120	<b>Z</b>
Cycloherane, 1, 1, 3—minethyl	20 20		9	15	120			72
Cyclonexane, 1, 2-cimethyl, cis	20 20	<b>2</b>	20	75	$\Box$	, <b>s</b>	E	48
Cyclonexame, 1, 2-Comethy 1, Trans		<b>Z</b>	100	$\mathbf{z}$	10		22	37
Cyclonezane, 1, 3-dimenty 1, mens	<b>100</b>	₽			100	122	72	<b>5</b> 7
Cyclonexene, i, 4-cimetryi, eis	<u> </u>	. E	$\mathbf{x}$		. 123	ID:	E	26
ביים ביים ביים ביים ביים ביים ביים ביים	<b>.</b>	72		<b>12</b> 0		100	<b>12</b>	-44
Cyclonerane, 1-stily1-i-methy1 trees	<b>100</b>	n		10	12		10	===
Cyclonexamore, 3,3,5-comerny	<b>12</b>	. =	Æ	12	:=	12	100	46
Characters, 2007;	10 10 10	10	E	I	150	<b>1</b>	Ξ	Ë
Characters meaning	E	<b>E</b>	$\Sigma$	::::	:C	12'	Ξ	$\Xi$
Charles againt asset	E	22	:=	:=	:=	=	Ē	=
Directivi persenes	) <u>.</u>		=======================================	=	=======================================	Ξ	· =	:: :::
	<b>=</b>	<b>1</b>			15	1 2 3	=	

<sup>23 =</sup> Estimated concentrations due to greater than 252 difference petween RF for initial calibration and RF for continuing calibration

and RF for continuing calibration
ND = Not Detectable
BNDL = Below Minimum Detection Limits
UJ3 = Estimated quantitation limit 16.4ug/kg
UJ4 = Estimated quantitation limit 27.1ug/kg
UJ5 = Estimated quantitation limit 22.9ug/kg
UJ6 = Estimated quantitation limit 17.8ug/kg

Units   Ug/kg   Ug/k	Sample #	M1190	M1191	M1192	M1193	M1196	M1197	M1209	M1242
Depth	Units								
Composite   Discrete   Discrete   Discrete   Composite   Discrete   D	Date of Submission					26-Apr	26-Apr		26-Apr
Composite/Discrete	Depth	0-18"							
VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-QUANTITATIVE) CONTINUED     VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-QUANTITATIVE) CONTINUED   VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-QUANTITATIVE)   VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-QUAN		Ď							
Mimethy1 cyclopentane	Soil (S)/Water (W)/Sediment (X)	S	S	S	S	S.	S	S	S
Dimethyl cyclopentane	VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-	QUANTITATIVE) CO	ONTINUED						
Dimethyl-3-hexene	dimethyl cyclohexane		-,						
Dimetryl-3-hexene	Dimethyl cyclopentane	ND				-,-			
Ethalame, 1.1'-oxybis	Dimethyl-3-hexene	ND	. ND						
Ethyl-methyl benzene Heptane, methyl Hydrocarbons ND 74,000 ND		ND	ND	-:					
Heptane, methyl		ND	ND	ND	ND	-,,			
Hydrocarbons		ND	ND	ND	ND	ND	· ND		ND
Methyl cyclohexane		ND	74,000	ND	ND				
1,810,000 3,200,000   ND   ND   ND   ND   ND   ND   ND		ND	ND	ND	ND	ND	ND	ND	ND
CAP_Xylenes		1,810,000	3,200,000	ND	ND	ND	ND	ND	ND
Pentane, 3-methyl		1,310,000	2,280,000	ND	ND	ND	ND	ND	ND
Pentanes, methyl				ND	ND	ND	ND	ND	
NO		ND	ND	ND	ND	ND	ND	ND	15
ND   ND   ND   ND   ND   ND   ND   ND		MD	ND	ŃД	ND	ИĎ	ND	ND	ND
PRIORITY POLLUTANTS   ND   880   ND   ND   ND   ND   ND   ND   ND   N		ND	ND	ND	ND	ND	ND	, ND	ND
ND   SEC   ND   ND   ND   ND   ND   ND   ND   N	ACID EXTRACTABLES	<del></del>							
NE	PRIORITY POLILITANTS					<del></del>		<del></del>	
2,4-Dichlorophenol   470   3,700   ND   ND   ND   ND   ND   ND   1780		· ND	880	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol 2,850 7,410 5,090 ND					ND	ND	ND	MD	1780
ND   ND   ND   ND   ND   ND   ND   ND		2.850			ND	NT	ND	890	2470
Phenol		_,				NT	NTD	ND	ND
ND   ND   ND   ND   ND   ND   ND   ND							, NT	ND	4000
Totals 7,450 13,490 5,890 0 0 0 890 8,250  BASE/NEUTRAL EXTRACTABLES  PRIORITY POLLUTANTS  Acenaphthene							NT	ND	ND
### PRIORITY POLLUTANTS  Acenaphthene	2,4,6-IIICHIOLOMICHOI		_,-						
PRIORITY POLLUTANTS  Acenaphthene  Acenaphthylene  Acenaphthyl	Totals	7,450	13,490	5,890	0	0	). C	890	8,250
Acenaphthene ND 15,500 ND ND ND 130 200 390 Acenaphthylene ND 3,500 ND ND ND ND 120 ND Acenaphthylene ND 3,500 ND ND ND ND 120 ND Acenaphthylene 4,700 14,600 ND ND ND 150 240 230 ND Henzo(a)anthracene 7,300 22,200 1,900 2,600 380 530 350 1,700 Henzo(a)pyrene 4,600 18,000 2,500 3,100 1,040 680 772 2,500 Henzo(b)fluoranthene 8,450 23,000 3,900 5,700 1,180 730 1,360 4,100 Henzo(chi)perylene 2,100 4,000 2,600 2,700 1,150 ND 814 ND his(2-Ethylhexyl)phthalate 290,000 186,000 7,100 7,500 11,200 2,110 56,800 75,900 Henzyl phthalate 30,100 4,100 ND ND 1,310 310 1,170 9,030	BASE/NEUTRAL EXTRACTABLES				•			•	
Acenaphthylene	PRIORITY POLLUTANTS								
Anthracene 4,700 14,600 ND ND 150 240 230 ND Benzo(a)anthracene 7,300 22,200 1,900 2,600 380 530 350 1,700 20,200 1,900 2,500 3,100 1,040 680 772 2,500 1,900 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 680 772 2,500 3,100 1,040 3,000 1,040 680 772 2,500 3,100 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 772 2,500 1,040 680 77	Acenaphthene	320							
Benzo(a)anthracene       7,300       22,200       1,900       2,600       380       530       350       1,700         Benzo(a)pyrene       4,600       18,000       2,500       3,100       1,040       680       772       2,500         Benzo(b)fluoranthene       8,450       23,000       3,900       5,700       1,180       730       1,360       4,100         Benzo(chi)perylene       2,100       4,000       2,600       2,700       1,150       ND       814       ND         bis(2-Ethylhexyl)phthalate       290,000       186,000       7,100       7,500       11,200       2,110       58,800       75,900         Buryl benzyl phthalate       30,100       4,100       ND       ND       1,310       310,170       9,030	Acenaphthylene				NI NI				
Benzo(a) pyrene       4,600       18,000       2,500       3,100       1,040       680       772       2,500         Benzo(b) fluoranthene       8,450       23,000       3,900       5,700       1,180       730       1,360       4,100         Benzo(ghi) perylene       2,100       4,000       2,600       2,700       1,150       ND       814       ND         bis(2-Ethylhexyl) phthalate       290,000       186,000       7,100       7,500       11,200       2,110       56,800       75,900         Butvl benzyl phthalate       30,100       4,100       ND       1,310       310,1,170       9,030	Anthracene	4,700	14,600	NI NI	) NE	150	240	230	
Benzo(a) pyrene       4,600       18,000       2,500       3,100       1,040       680       772       2,500         Benzo(b) fluoranthene       8,450       23,000       3,900       5,700       1,180       730       1,360       4,100         Benzo(ghi) perylene       2,100       4,000       2,600       2,700       1,150       ND       814       ND         bis(2-Ethylhexyl) phthalate       290,000       186,000       7,100       7,500       11,200       2,110       56,800       75,900         Butvl benzyl phthalate       30,100       4,100       ND       1,310       310,1,170       9,030	Benzo(a)anthracene	7,300	22,200					350	1,700
Benzo(b)fluoranthene       8,450       23,000       3,900       5,700       1,180       730       1,360       4,100         Benzo(ghi)perylene       2,100       4,000       2,600       2,700       1,150       ND       814       ND         bis(2-Ethylhexyl)phthalate       290,000       186,000       7,100       7,500       11,200       2,110       56,800       75,900         Buryl benzyl phthalate       30,100       4,100       ND       ND       1,310       310,1,170       9,030	Benzo(a)pyrene	4,600	18,000	2,500			680	772	2,500
bis(2-Ethylhexy1)phthalate 290,000 186,000 7,100 7,500 11,200 2,110 58,800 75,900 8urv1 benzy1 phthalate 30,100 4,100 ND ND 1,310 310,1,170 9,030		8,450	23,000	3,900	5,700			1,360	4,100
bis(2-Ethylhexy1)phthalate 290,000 186,000 7,100 7,500 11.200 2,110 58,800 75,900 8mry1 benzyl phthalate 30,100 4,100 ND ND 1,310 310,1,170 9,030	Benzo(chi)pervlene	2.100	4,000	2,600	2,700	1,150		814	<b>K</b>
Buryl benryl phthalate 30,100 4,100 ND ND 1,310 310,1,170 9,030				7.100	7,500	11,200	2.110	58,800	75,900
Chrysene 7,910 24.400 2.200 2,700 690 600 ND 2.100							310		
	Crrysene	7,910	24,400	2.200	2,700	690	600	, NE	2,100

Sample (	M1190	M1191	M1192	H1193	M1196	111197	H1209	111242
Units	ug/kg	ug/kg	ug/kg	ug/kg	uq/ka	ug/ka	ua/ka	ua/ka
Date of Submission	25-Apr			25-Apr		28-Apr	28-Apr	28-Apr
Depth	0-18"	18-36"	0-18"	18-36"	0-18"	18-36"	0-18.	•
Composite/Discrete	D	D	Ď	D	D	b	c	c
Soil (S)/Water (W)/Sediment (X)	S	S		S	S	5	s	5
BASE/NEUTRAL EXTRACTABLES, PRIORITY FOLLUTAN	TS CONTINUED				,		*****	
Dibenzo(a,h)anthracene	ND	ND	ND	ND	NĎ	ND	ND	
1.4-Dichlorobenzene	ND	11.800	ND	ND	HD	ND	ND	
Diethyl phthalate	7.550	ND	ND	ND	ND	ND	320	
Dimethyl phthalate	ND	ND.	ŃD	, ND	. 330	ND	ND	*
Di-n-butyl phthalate	83,200	113.000	1,100		700	150	3.870	13,100
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	1.900	ND	ND
Di-n-octyl phthalate	4,400	ND	ND	ND	310	ND	2.060	5.400
Fluoranthene	14,900	35.900	2.100	3,900	670	1.000	490	
Fluorene	7.400	29,300	ND	ND	80	130	220	
Indeno(1,2,3-c,d)pyrene	1,200	3,500	2.100	2.000	877	סא	560	1.600
Isophorone	ND	ND	ND	ND	600	ND	ND	110
Naphthalene	50.800	191,000	1,200	ND	680	390	5.630	31.000
N-Nitrosodiphenylamine	ND	ND ND	ND	ND	ND	מא	3,630	
Phenanthrene	26.200	80.800	ND	1.900	670	1.100	966	4.200
Pyrene	19.200	56.200	2.900	4.000	866	950		
1,2,4-Trichlorobenzene	5.600	24,700	2. 900 ND	ND.	ND	ND	590 350	2.700 2.100
Totals	575,610	861,500	29,600	37,300	22,883	10.950	78,872	158,420
BASE/NEUTRAL/ACID EXTRACTIBLES, ADDITIONAL PR	CAKS (SEMI-O	ITĄTĮTNAU	VE) CON	TIRUED				•
IH-Indene octahydro 2,2,4,4,7,7-hexamethyl	ND	ND	ND	ND	ND	ND	ND	
1H-Benzo(b) fluorene	ND	ND	ND	ND	מא מא	מא	ND	מא טוו
lii-Indene, 2, 3-dihydro	NTD	ND	ND	ND	ND ND	ND ND	HD HD	ND
1H-Inden-5-01,2,3-dihydro	RD	ND	ND	RD.	ND	ND:	ND	NE
1,1'-Biphenyl	RD	ND	ND	ND	ŇD	RD	ND	110
1.2.3.4-Tetramethyl benzene	ND	ND	ND	ND	. ND	ND	מא	NE
1.2.3-Trimethyl benzene	49.600	RD	ND	ND	ND	ND		111
1-Methyl anthracene	ND	ND	ND	IID	ND	NE	ND	PIE
2.6-Dimethyl nonane	ND	ND	ND	NE	ND	ND	23	NE
2-Ethyl hexanoic	ND.	ND.	NTD	KD	ND	מא	ND	NE
2-Ethyl naphthalene	ŇD	NE.	NE	NE	111	N.D.	170	26.501
2-hydroxy benzaldehyde	ND	NZ	2.650	NE	NE	ND	NE	NE.
2-methyl 1.1'-biphenyl	· ND	ND	NE	ND.	WE	ND		NE.
2-Methyl enthracenes	NZ	214	NE	82	Nº	NE NE		NO NO
2-Methyl naphthalene	ND.	NT.	MC.	114 124	NZ NZ	NTC STM	, N.	
2-Methyl phenanthrene	ND	NE	NE	NE	NE NE			. 85
2-methyl phenol	NEC.	NE	9.770	NC PK	NE NE	170	ND	
2-Propendic acid. 2-Nethyl, Dodecyl ester	. ND	ND.	NE.	24	NL	NE NE	iet.	NT
	4D	P.L.	ME	M.C.	NT.	NC	14.0	NE

J = Estimated concentration, OC Blank contaminates with 126mg/1 of di-n-butvi nothelate

Sample #	M1190	M1191	M1192	M1193	M1196	M1197	M1209	M1242
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Date of Submission	25-Apr	25-Apr	25-Apr	25-Apr	26-Apr		26-Apr	26-Apr
Depth	0-18"	18-36"	0-18"	18-36"	0-18"	18-36"	0-18"	_
Composite/Discrete	D	D	D	D	D	מ	C	C.
Soil (S)/Water (W)/Sediment (X)	s	s	S	S	S	S	S.	S
BASE/NEUTRAL/ACID EXTRACTIBLES, ADDITIONAL PEAKS	(SEMI-CÚI	WTITATIV	E) CONT	INUED			•	
3-Ethyl-2-Methyl heptane	МD	21,100	ND	ND	ND	ND	MD	ND
3-Methyl phenanthrene	ND	ND	ND	ND	ND	ND	MD	ND
3-Methyl phenol	, ND	ND	ND	ND	ŊD	ND	ND	8,676
4-Methyl phenanthrene	ND	ND	ND	· ND	ND	ND	МD	ND
4-Methyl phenols	ND		73,500	ND	ND	ND	ND	10,771
Alkanes	196,600	243,500	17,170	ND	ND		-	123,250
Benzenesulfonamide, 4-methyl	ND	ND	ND	ND	378	ND	ИD	И́Д
Bicyclo(3,2,1)oct-2-ene,3-methyl-4-methylene	ND	ND	ND	ND	ND	·ND	ND	MD
Cyclohexane, pentyl	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl benzene	, ND	MD	ND	ND	ИD	ND	ND	ND
Dimethyl 2-pentenes	ND	. ND	7,250	ND	ND	ND	ND	ND
Dimethyl ethyl phenol	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl heptane	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl naphthalenes	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl pentenes	ND	ND	ND	ND	ND	514	ND	ND
Dimethyl phenanthrenes	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phenols	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl-ethyl benzenes	ND	, ND	ND	ND	ND	ND	ND	ND
Dimethyl-ethyl phenol	ND	ND	ND	ND	ND	ND	ND	58,969
Ethanone, 1-(4-ethyl phenyl)-ethyl	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzenes	91,300	67,700	ND	ND	564	ND	ND	53,189
Ethyl methyl benzene	ИD	ND	ND	ND	ND	ND	ND	ND
Ethyl naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl phenols	ND	ND	ND	ND	, MD	ND	MD	ND
Ethyl- methyl benzenes	ND	ND	ND	NI	ND	ND	ND	ND
Ethyl-1,2,3-trimethyl benzene	ND.	ND	ND	NI	ND	ND	ND	ND
Ethyl-1,2,4-trimethyl benzene	ND	ND	ND	NI	NI	ND	ND	ND
Ethyl-dimethyl benzenes	96,300	ND	ND	NI	773	ND	31.040	114,556
Ethyl-methyl benzenes	388,900	129,900		NT.				275,877
Ethyl-methyl phenols	NED	1570	NO					0
Ethyl-propyl benzene	<u>20</u>	<b>X</b> D						-
Rexadecanoic acid	NTD	NTO						
Hexanal	<u>120</u>	ND						
Hydroxy benzaldehyde	Ν̈́D	N	NI	) NI	) <u>ist</u>	NT.	ND	150
Methoxy benzaldenyde	120		19,600					
Methyl benzenes	113,000	47,400						
Methyl ethyl benzene	150	NZ.						
Methyl Fluorenes	ND	NZ.						
Methyl nanhthalene	22	72						
Methyl phenanthrene	720							
Methyl phenols	NE	S. S.						
Metinyl—ethyl benzene	)	45,700						
		,			- 130			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

## TABLE ( (CONTINUED) STORMAP: OF AREA I CHEMICAL ANALYSIS RESULTS

		M1191	M11197	119	**1 1 44		11:20=	• : 74.
iamir) c +	Milen	MIIT:	90/45	ug/kc		uu/Ko	U2 45 E	UU 85
in; t f	úé/Kc	25-APT	25-40-	in her	h-Art 7	h-Arr	76-461	24-8t t
once of Sulmission	25-Apr	16-36"	0-16	16-36"	0-18" 1	6-36 "	(+1P"	
impire ti		t) 16-36	1.	יו	11	15	ς	Ċ
omposite/Unscrete	b	. S	,	<	5	5	<u> </u>	5
cil (S)/water (W)/Sediment (X)	5							
		TITATIVE	) (0):71	RUED				
DASE/NEUTRAL/ACTO EXTRACTIBLES, ADDITIONAL PEAKS	(SENT-GOM	C) 2.1,1112 4 C	, 0,0					
and the same of th	ND	ND	NE	Ht.	ist	1111	#D #E	1115
methyl-ethyl phenols methyl-methyl ethyl phenols	P#17	ND	KI.	iii)	M.	121	1211	1111
lethyl-methyl-ethyl benzenes	МD	48.400	nt	3,180	111.	6982 141.	111	1112
nethy 1-meety 1-ceny	ND	26.300	NU	m	1117	1211	4, 925	121)
nethyl-propyl benzenes	81.900	26,300	ND	NI.	(11)	131	117	1711
Haphthalenc, decanydro, trans	ND	ND	ŅI	йD		221)	111.	121:
N-propyl benzamide	ND.	HD	NL	NI)	ND	NI:	121.	111
Phosphoric acid, triphenyl ester	พบ	NI	611)	ND	NI:	ND:	127	110
Propyl benzenes	27,600	17,700	H	110	NI.	1411	1211	1217
Tetrachlorobiphenyls	NI	ND	ND	ND		1111	171	7211
Tetradecanoic acid	ND	ND	HD	NU	IID	111	5. P42	25.960
Tetramethy) benzenes	112,200	ND	4364	ND	1,187	MD int.	3,742	80
Tetramethyl butyl phenois	ND	ND	##E)	ND	HD.	ND ML	110	1312
Trichlonethene	ND	ND	NL	หม	11) 894	RD	110	ND
Trimethyl benzenes	ND	B2.100	ND	ND	•	MI.	110	1212
Trimethyl naphthalenes	ND	ND	NL	ND	ND	ND	1717	110
Trimethyl phehols	ND	ND	411	ND	ND	759		232.560
Xylenes	475.000	238.700	3,600	ND	1.868	, , ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;		
ГСВ								,
PRIORITY POLIUTANTS				-12			****	M*
	ND.	ND	שמו	NI	. HD .	NI	NL	- M.T.
Araclar 1742	WD , ,	•	11	. 11	11	11	]]	]]
Aroclor 1242	87.00cJ1	73,000	337.00C	J11.400	31 1.80C	11 140	<sup>31</sup> 2.800	1.100
Aroclor 1242 Aroclor 1254 Totals	87.00c <sup>J</sup> l					11 140		31 1.10m
Aroclor 1254 Totals	87.00C <sup>J1</sup>	73,000	J <sub>57</sub> , 000	J11,400	J1 1.800 ·	)) 140·	J1 <sub>2.800</sub>	J1 1,100
Aroclor 1254	87.00C <sup>J1</sup>	73,000	J <sub>57</sub> , 000	J11,400		)) 140·	J1 <sub>2.800</sub>	J1 1,100
Arocior 1254 Totals  METALS UNITS	87,000 <sup>J</sup> 87,000 <sup>J</sup> mg/kg	73,000 mg/k	J137,000 g mg/k	Jl1,400 g mg/kg	Jl 1,800	13 140° 11 140° mg/ka	J1 2.800	m3/kg
Arocior 1254 Totals HETALS UNITS PRIORITY FOLLUTANTS	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mg/kg	73,000 mg/k	337,000 g mg/k	J11,400 g mg/kg	Jl 1,800 mg/kg	13 140 11 140 mg/kg 1-20	J1 2.800 mg/kg 6.70	J1 1,100 m2/kg
Aroclor 1254 Totals METALS UNITS	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mg/kg 12.00 36.00	73,000 mg/k 16.00 73.00	g mg/k	Jl <sub>1,400</sub> g mg/kg 3.20 26.00	1.00 5.60	1-20 1-50	J1 2.800 mg/kg 6.70	J1 1,100 mg/kg 12.00 62.00
Arocior 1254  Totals  METALS UNITS  PRIORITY FOLLUTANTS  Antimony Arsenic	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mq/kq 12.00 36.00 1.20	73,000 mg/k 15.00 73.00 C.16	g mg/k	Jl1,400 g mg/kg 3.20 26.00 C.59	mg/kg 1.00 5.60 0.38	13 140° 11 140° mg/kg 1.20° 1.50° 0.34°	me/kg 6.70 18.00	J1 1,100 m2/kg 12.00 62.00 9.70
Arocior 1254  Totals  METALS UNITS  PRIORITY POLLUTANTS  Antimony	87,000J1 87,000J1 mg/kg 12.00 38.00 1.20 62	73,000 mg/k 15.00 73.00 6.16	g mg/k	3.20 25.00 0.59	mg/kg 1.00 5.6C 0.3e 7.90	1.20 1.50 1.50 1.50 1.50	### 6.70 18.00 0.25	12.00 62.00 9.70
Aroclor 1254  Totals  METALS UNITS  PRIORITY FOLLUTANTS  Antimony Arsenic beryllium	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mg/kg 12.00 36.00 1.20 62 790	73,000 mg/k 15.00 73.00 C.15 71 590	g mg/k  1.70 24.00 67	3.20 25.00 0.59	mg/kg 1.00 5.60 0.38 7.90	1.20 1.30 1.30 1.30 1.50 0.34 0.35	######################################	12.00 62.00 9.70
Aroclor 1254  Totals  METALS UNITS  PRIORITY FOLLUTANTS  Antimony Arsenic beryllium Cadmium Chromium	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mq/kq 12.00 36.00 1.20 62 790 1.580	73,000 mg/k 16.00 73.00 6.16 71 590	g mg/k 1.70 24.00 67 380	3.20 25.00 0.59 430	1.00 5.60 0.38 7.90	1.20 1.50 0.34 0.35 10.00	### ### ##############################	12.00 62.00 9.70 29 510
Aroclor 1254  Totals  HETALS UNITS  PRIORITY POLLUTANTS  Antimony Arsenic Beryllium Cadmium Chromium Copper	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mg/kg 12.00 36.00 1.20 62 790 1.580 6.200	73,000 mg/k 15.00 73.00 6.16 71 590 870 8.520	g mg/k 1.70 24.00 0.52 6 7.380	3.20 25.00 0.59 430	mg/kg 1.00 5.60 0.38 7.90 130 140	mg/kg 1.20 1.50 0.34 1.060	######################################	12.00 62.00 9.70 29 510 2.050 5.600
Aroclor 1254  Totals  METALS UNITS  PRIORITY FOLLUTANTS  Antimony Arsenic Beryllium Cadmium Chromium Chromium Copper Lead	87,000J1 87,000J1 mg/kg 12.00 38.00 1.20 62 790 1.580 6.200 9.10	73.000 mg/k 15.00 73.00 C.16 71 590 8.70 6.520	3 mg/k 1.70 24.00 67 380 1.440	3.20 26.00 0.59 10 430	mg/kg 1.00 5.60 0.38 7.90 130 140 1.010	1.20 1.20 1.20 1.20 1.30 0.35 10.00 1.000 0.27	me/kg 6.70 18.00 0.25 27 305 1150 2.500 1.20	12.00 62.00 9.70 510 2.050 5.600
Aroclor 1254  Totals  HETALS UNITS  PRIORITY POLLUTANTS  Antimony Arsenic beryllium Cadmium Chromium Copper	87,000 <sup>J1</sup> 87,000 <sup>J1</sup> mg/kg 12.00 36.00 1.20 62 790 1.580 6.200	73,000 mg/k 15.00 73.00 6.16 71 590 870 8.520	9 mg/k 1.70 24.00 0.52 67 380 1.440	Jl1,400 g mg/kg 3.20 26.00 C.59 96 430 NI	mg/kg 1.00 5.60 0.38 7.90 130 140 1.010 1.90 24.00	mg/kg 1.20 1.50 0.34 1.060	me/kg 6.70 18.00 0.25 27 305 1.500 1.20	31 1,100 mg/kg 12.00 62.00

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Sample & Units Date of Submission Depth Composite/Discrete Soil (S)/Water (W)/Sediment (X)	M1190 ug/kg 25-Apr 0-18" D S	H1191 ug/kg 25-Apr 18-36" D S	M1192 ug/kg 25-Apt 0-18" U S	H1193 ug/kg 25-Apr 18-36" D S	n1196 ug/kg 28-Apr G-18" D S	H1197 ua/kg 26-Apr 18-36" U S	2 (1-18, 58-ybt n3/kd 11508	111742 ug/kg 28-Apr C S
METALS. PRIORITY FULLUTANTS CONTINUED UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mą/ką	mg/kg	mg/kg	mg/kạ
*	2.80	2.70	6.40	4.20	0.69	0.22	6.40	4.40
Silver	ND	ND	0.14	ND	0.29	0.23	0.43	ND
Thallium Zinc	6,120	4,970	1.050	1,400	640	130	2.760	12,200
Totals	16,976	15,227	3.014	1.979	1.962	1.247	6.885	20.699
PESTICIDES								
PRIORITY POLLUTANTS	<del></del>							
Heta-BHC	ND	ND	ND				ND	ND
4.4'-DDE	ND	- ND	ND	ND	-, -	ND	ND	ND
4.4'-DDD	ND	ND	ND	ND			ND	ND ND
Endosulfan sulfate	ND	ND	*,	ND	-			
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	IND
Totals	0 -	. 0	. 0	O	0	. 0	0	. 0
PHÉNOLICS & CYANIDE								
Units	mg/kg	mg/kg						mg/kg
Phenolics, Total	13.00	0.24						5.90
Cyanide, Total	16.00	13.00	1.70	2.30	2.20	1.00	0.73	16.00

Samples M1190 and M1191 were the only samples in Area B to have excessive levels of contamination from volatile organics (see Table 6 and Figure 4). M1190 (0-18") and M1191 (18-36") both exceeded the clean-up levels of mg/kg total volatile organics (VOA) used by the BISE, with total priority pollutant concentrations of 579 mg/kg and 852 mg/kg, respectively. There are also high concentrations of the non-priority pollutant VOA xylene (in all its isomeric forms) in samples M1190 and M1191. It is not surprising that the deeper sample had higher VOA concentrations as samples closer to the surface volatilize more easily. No other samples in Area B had concentrations of VOAs exceeding 1 mg/kg.

Samples M1190 and M1191 are also the only samples in Area B to exceed the cleanup level criteria for total cyanides (12 mg/kg) with concentrations of 16 mg/kg and 13 mg/kg, respectively.

There was no consistency in the results with respect to depth, as some organic parameters were higher in the 0-18" interval than in the 18-36" interval, while others were higher in the lower depth interval than in the surface interval. For example, in samples M1190 and M1191, most of the priority pollutant base/neutral organic parameters were higher in M1191 than in M1190, while for alkanes (a nonpriority pollutant), xylenes and other non-priority pollutant base/neutrals, the reverse was true. The same is true for M1192, M1193 and M1196/M1197 (which is upgradient of the M1190/M1191), but with lower concentrations.

The alkane concentrations in the borings of samples M1192/M1193 and M1196/M1197 were likewise inconsistent, but to a greater degree. For M1192 (0-18") the alkane concentration was 17.2 mg/kg while from 18"-36" (M1193) there was no detectable concentration. The opposite is true for samples M1196 and M1197: M1196 had no detectable levels of alkane while M1197 had 2.2 mg/kg. Samples M1190/M1191, the boring for which is only 75 feet south of that for M1196/M1197, had high concentrations in both intervals.

PCB's also greatly exceeded cleanup levels of 1-5 mg/kg in samples M1190, M1191 and M1192 with concentrations of 87 mg/kg, 73 mg/kg and 37 mg/kg, respectively. Samples M1190 and M1191 also exceed USEPA trigger levels of 50 mg/kg.

Heavy metal concentrations that exceeded BISE cleanup levels were detected in all soil samples in Area B. The metals were the same as those found in Area A but with the addition of Arsenic (As), nickel (Ni), and silver (Ag). The highest levels were found in samples M1190/M1191 with Pb (8,200/8,520 mg/kg), Cr (790/590 mg/kg), Cd (63/71 mg/kg), Hg (9.1/1.9 mg/kg), Zn (6,120/4,970 mg/kg), and Cu (1,580/870 mg/kg) well above other discrete soil samples concentrations. Only composite sample M1242 (18-36") had higher levels of Cu and Zn.

The extensive metal contamination found throughout Area B is most likely from leaching of the ash pile and runoff from the drum storage area. Area B is in closer proximity to both these sources than Area A thereby resulting in higher contaminant levels.

#### SUMMARY OF AREA C CHEMICAL ANALYSIS RESULTS

Sample # Units Date of Submission Depth	ug/kg u 26-Apr 26 (-18" 16	1195 g/kg -Apr -36"	M1203 ug/kg 06-May 3-5'	13-15	M1206 ug/kg 06-May 17.5-19	M1207 ug/kg 26-Apr G-18"	M1208 ug/kg 26-Apr 16-36"	-
Comparis A / Discrete	٥	D	D	D	D S	C S	C S	D W
Soil (S)/Water (W)/Sediment (X)	S	S 	S 	S				
VOLATILE ORGANICS				<del></del>		- <del></del>	<del> </del>	
PRIORITY POLLUTANTS		, m	85.3	5.6	ND	453	1,100	5.58
Benzene	, ND	ND ND	83.3	מא ב	ИD	מא	ND.	ND
cis-l.3-Dichloropropylene	177	NT	333	46	111	10.0	44 300	15 0
Ethylbenzene	ND UJ7.	ND I	W8 34	, D	44	46.9 <sup>J2</sup>	5,2B0	13 TNDUJS
Methylene chloride	ND	ND	6.8	ND	ND	ND	ND	ND
Tetrachloroethylene	2.1	ND	318	58	85	25.2	218,000	76.6
Toluene	***							
Totals	2-1	Ò	777.1	109.6	240	96.53	268,680	98.08
VOLATILE ORGANICS, ADDITIONAL PEAKS (SEMI	-OUANTITATIVE	)	•			•	•	
n washed havens	ND	ND	295	ND	ND	ND	ND	ND
2-Methyl hexane	ND	ND	ND	ND	ND	ND	ND	323
2-Pentanone, 4-Methyl	120	ND	. ND	71	ND	1,050	ND	64
2-Propanones	, 120	ND	ND	ND	ND	ND	62,000	ND
3-methyl benzene	ΝD	ND	ND	NI	ND N	ND	ND	
3-Methyl pentane 4-Ethyl 2-Pentanone	ND	ND	572	NI	ND	. ND	ND	ND
4-Methyl 2-Pentanones	120	ND	ND	1,023	240	ND	ND	
Acetone	720	ND	ND	NI	<b>C</b> Z4	IID	ND	
Alkanes	720	ND	409	NI		ND	ND	
Alkyl benzene	<b>13</b> 70 -	ND	ND	NI		12D	42,000	
Benzene ethenyl-methyl	ND	ND	ND	NI		ND	ND.	
Benzene, 1,2,3-trimethyl	ND	ND	ND	NI		ND	ND	
Cycloheptane, methyl	ND	ΝD	ND	NI		ND	ND	
Cyclohexanes, 1,1,3-trimethyl	ND	ЙD	ND	NI		160	ND	-,
Cyclohexane, 1,1-dimethyl	1/20	KD	1820	121		1XID	1/20	
Cyclohexane, 1.3-dimethyl	ND	ND	ND			ND	ND	
Cyclonexanes, 1,3-dimethyl, dis	<b>72</b> 0	ND	ND			94	122	
Cyclohexanes, 1.3-dimethyl, trans	<b>ZZ</b>	120	723	15.		53	22	
Cyclonexene, 1, 1, 3-trimethyl	120	<b>1</b> 23	700			755	ZZ.	
Cyclonexame, 1, 2-dimethyl, dis	<b>1</b> 20	<b>1</b> 20				22 22	, KI	
Cyclonexame, 1, 2-dimethyl, trans	. <b>15</b> 0	72				NO NO	- 2A	
Cyclonexane, 1, 3-dimethyl, trans	<b>120</b> .	720				10	-24 -24	
Cyclohexane, 1, 4-cimethyl, cis	<u> </u>	ZZ ZZ				20 20		
Cyclonexame, i-ethyl-4-methyl cis								
Cyclonezene, i-ethyi-4-methyl trans	, 1 <u>2</u>	, <u>x</u>		2		Z		36
Cyclonexamone, 3.3.5-trumethyl	Z2	Z Z		<u> </u>		<u>~</u>	-	
Cyclocerene, buryl						994	<u>z</u>	
Cyclopentane, methyl			: 150 : 150				72	
Cyclopentane, 1, 3-dimethyl, trans		<u></u> 22					N.	
Dimennyl benzenes	٠					. •••		

J2 = Estimated concentration due to %RSD for response factor in initial calibration higher than 30% J3 = Estimated concentration due to greater than 25% difference between RF for initial calibration and RF for continuing calibration ND = Not Detectable BMD1 = Below Minimum Detection Limits UJ7 = Estimated quantitation limit 16.4ug/KS UJ8 = Estimated quantitation limit 16.9ug/KS UJ9 = Estimated quantitation limit 11.0ug/1

Sample # Units Date of Submission Depth Composite/Discrete Soil (S)/Water (W)/Sediment (X)	M1194 ug/kg 28-Apr 0-18" D	M1195 ug/kg 28-Apr 18-36" D S	M1203 ug/kg 06-May 3-5' D S	M1205 ug/kg 06-May 13-15' D S	M1206 ug/kg 06-May 17.5-19 D S	M1207 ug/kg 26-Apr 0-18" C S	M1208 ug/kg 26-Apr 16-36* C S	M1217 ug/1 27-May D
VOLATILE ORGANICS ADDITIONAL PEAKS (SEMI-	OUANTITATIV	E) CONTI	NUED					
dimethyl cyclohexane Dimethyl cyclopentane Dimethyl-3-hexene Ethane, 1,1'-oxybis Ethyl-methyl benzene Heptane, methyl Hydrocarbons Methyl cyclohexane m-Xylenes O&p-Xylenes Pentane, 3-methyl Pentanes, methyl	2222222222222		179 218 412 MD MD MD 2.078 MD MD 2.078	9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	22222222222222	ND ND ND ND 115 ND ND ND ND ND ND ND ND ND ND ND ND ND	ND ND ND ND ND 13,000 ND 1,010,000 769,000 ND ND	ND N
Propyl benzene Xylenes	ND	. NI	7,105	91	1,535	ND	ND	326 .
ACID EXTRACTABLES				· · · · · · · · · · · · · · · · · · ·				
PRIORITY POLLUTANTS		· ND	ND	ND	NTD	ND	ŃД	ND
2-Chlorophenol 2.4-Dichlorophenol 2.4-Dimethylphenol Pentachlorophenol Phenol 2.4.6-Trichlorophenol	ND ND ND ND ND ND	ND	ND 188,000 ND 27,700	ND	ND 11,500 ND 750	20 20 20 20 20 20 20 20 20 20 20 20 20 2	3,600 1,000 17,600	ND 860 ND 877
Totals	0	. 0	215,700	138,800	12,250	0	22,850	1,737
BASE/NEUTRAL EXTRACTABLES		<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>				<del></del>		<del></del>
PRIORITY POLLLYTANTS	<del></del>		<del></del>			<del></del>	<del></del>	<del></del>
Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(chi)perviene bis(2-Ethylhexyl)phthalate Butyl benzyl phthalate Curveene	100 100 100 100 100 100 100 100 100 100	ND ND ND ND 1,700	BMDI 10,100 SD BMDI 61,700	15,300 16,800 11,000 NI BMIL	MD 310 300 510 MD 250 1,500	250 140 500 994 1,200 895 4,620 110	NI N	

Sample *	M1194	M1195	M1203	M1205	M1206	M1207	M1208	M1217
Units	ug/kg	ug/kg	ug/kg	ug/kg	-	ug/kg	ug/kg	ug/l
Date of Submission	28-Apr	28-Apr	06-May		06-May			27-May
Depth	C-18"	18-36"	3-5 '		17.5-19	0-18"	18-36"	_
Composite/Discrete	. D	D	Ď	D	D	C S	C Ŝ	D W
Soil (S)/Water (W)/Sediment (X)	\$ 	S	s	S	S 	 >	S 	
BASE/NEUTRAL EXTRACTABLES, PRIORITY POLLUTA	NTS CONTI	NUED						
Dibenzo(a,h)anthracene	ND	ND	ND	BMDL	ND	140	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	מא
Diethyl phthalate	ND	ND	ND	ND	, ND	ND	11,500	ND
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	22,000	ND
Di-n-butyl phthalate	ND	ND	11,300	45,300	480	96	87,900	ND
2,6-Dinitrotoluene	ИD	ND	ND	ND		ND	ND	ND
Di-n-octyl phthalate	ИD	ND	ND	. ND		ND	15,700	ND
Fluoranthene	ND	ND	12,200	32,000		460	3,400	
Fluorene	ND	ND	BMDL	19,300		MD	2,800	3.15
Indeno(1,2,3-c,d)pyrene	ND	ND	BMDL	BMDL	280	640	ND	ND
Isophorone	ND	ND	ND	ND		260	ND	
Naphthalene	ND	ND	44,700	13,700	-	240	179,000	
N-Nitrosodiphenylamine	ND	ND	ND	. ND		ND	ND	
Phenanthrene	ND	ND	18,900			430	8,180	4.9
Pyrene	ND	ND	11,700	25,300		894	4,700	
1,2,4-Trichlorobenzene	ND	ND	ND	ИD	ND	ND	6,200	ND
Totals	4,100	1,700	170,600	246,700	8,390	12,539	778,880	34
BASE/NEUTRAL/ACID EXTRACTABLES, ADDITIONAL	PEAKS (SI	MI-QUAN	<b>TITATIVE</b>	)				
1H-Indene octahydro 2,2,4,4,7,7-hexamethyl	ND	ND	ND	ND	ND	ND	ND	
1H-Benzo(b) fluorene	ЙD	ND	ND	ND		ND	ND	
lH-Indene, 2, 3-dihydro	MD	MD	ND			ND	2,250	
1H-Inden-5-ol, 2, 3-dihydro	ND	ND	19,700			ND	ND	
1,1'-Biphenyl	ND	ND	סומ			ND	ND	
1,2,3,4-Tetramethyl benzene	ND	ND	ND			ND	ND	
1,2,3-Trimethyl benzene	ND	ND	ND			ND	ND	
1-Methyl anthracene	ND	ND				ND	ND	
2,6-Dimethyl nonane	ND	ND				ND	ND	
2-Ethyl hexanoic	<b>72</b> D	ND				ND	ND	
2-Ethyl maphthalene	KD	<b>7</b> 2D				120	ND	
2-hydroxy benzaldehyde	ND	ND.				KD	ND	
2-methyl 1,1'-biphenyl	ND	120				<b>12</b> 20	1533	
2-Methyl anthracenes.	ND	720				720	ND	
2-Methyl naphthalene	ND		ND	) NI		ND	NI	-
2-Methyl phenanthrene	<b>123</b>	<b>1/2</b> D				ND	NE	
2-methyl phenol	100	ND				72	N.	
2-Propenoic acid, 2-Methyl, Dodecyl ester	NID	ND	NZ.	, KI		120	No.	, <b>1</b> 22

Cimple +	M1194	M1195	M1203	M1205	M1206	M1207	M1208	M1217
Sample #	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/l
Units Date of Submission	28-Apr	26-Apr	06-May		06-May	28-Apr	26-Apr	27-May
	0-18"	18-36"	3-5		17.5-19	0-18"	16-36"	_
Depth (Pinaneae	D	D	D	D	D	C -	С	D
Composite/Discrete	S	Š	Š	s	Š	Š	s	W
Soil (S)/Water (W)/Sediment (X)								
BASE/NEUTRAL/ACID EXTRACTIBLES, ADDITIONAL PR	eaks (Si	TMAUQ-IME	ITATIVE)	CONTIN	JED			
3-Ethyl-2-Methyl heptane	ND	ND	ND	ND	ND	ND	ND	ND
3-Methyl phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND
3-Methyl phenol	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl phenols	ND	ND	ND	ИD	ND	ND	ND	ND
Alkanes	2,870	ND	53,000	ND	937	ND	2,790	ND
Benzenesulfonamide, 4-methyl	ND	ND	ИD	ND	ND	ND	ND	ND
Bicyclo(3,2,1)oct-2-ene,3-methyl-4-methylene	ND	ND	ND	ND	ND	ND	2,870	ND
Cyclohexane, pentyl	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl benzene	ND	ND	ИD	ND		ND	2,560	ND
Dimethyl 2-pentenes	ND	ND.	MD	ND		ND	МD	ND
Dimethyl ethyl phenol	ND	ND	ND	1,400		DZ.	ND	
Dimethyl heptane	1,830	ND	ND	ND		ND	ND	ND
Dimethyl naphthalenes	ND	MD	ND	ND		ND	ND	
Dimethyl pentenes	ND	165,770	ND	ND	ND	ND	ND	
Dimethyl phenanthrenes	ND	ND	ND	ND	ND	ND	ND	
Dimethyl phenols	ND	ND	6,860	1,090	6,019	ND	ND	
Dimethyl-ethyl benzenes	ND.	ND	29,000	ND	ND	ND	ND	
Dimethyl-ethyl phenol	ND	ND	ND	ND	ND	ND	ND	ND
Ethanone, 1-(4-ethyl phenyl)-ethyl	ND	MD	ND	21,210	ND	ND	ND	ND
Ethyl benzenes	ND	ND	ND	ND	ND ND	270	2,450	
Ethyl methyl benzene	ND	ND	ND	ND	ND	ND	16,730	
Ethyl naphthalene	ND	ND	ND	NE	NID	ND	ND	
Ethyl phenols	ND	MD	6,890	11,410	: ND	ND	ND	) ND
Ethyl- methyl benzenes	ND	MD	ND	NI	ND ND	ND	10,770	ND
Ethyl-1,2,3-trimethyl benzene	NTD	ND	ND	NI	MD.	ND	1,980	. ND
Ethyl-1,2,4-trimethyl benzene	NE		ND	NI	NID	ND	ND	. ND
Ethyl-dimethyl benzenes	ND		ND	NI	OTA C	ND	16,100	ND
Ethyl-methyl benzenes	NT			NI		315	ND	MD M
Ethyl-methyl phenols	NE		17,880	16,280		MD	NI	) <u>X</u> TD
Ethyl-propyl benzene	NT		35,100	NI		<b>N</b> TD	NE	NTD
Hexadecanoic acid	NI	-	ND	NI		ND.	NI	NID
Feranal	) T		. 1570	152		22	22	ND ND
Bydroxy benzaldenyde	, K		ND	KI	CZZ C	150	22	) NEO
Hethoxy benzaldenyde	NI					NED	KI	
Methyl benzenes	13,280			_	) NTD	1,585	7,780	) <b>15</b> 5
Hethyl ethyl benzene	NI.	-				220	1.375	
Methyl Fluorenes	22					) )	15	
Methyl nanhthalene						Œ	22	
			22			<u> </u>	* S	
Methyl phenanthrene	2					27	N.	
Methyl phenols Methyl-ethyl benzene	2Z		,,			150	N.	
THE STATE OF THE S				-		٠		-

TABLE 7 (CONTINUED)
SIMPLADE OF AREA C CHEMICAL ANALYSIS RESULTS

						,		
	-/		H1203	111.205	#11206	111.20.7		1217
ample for the second		111 1 95	ua/ka	ug/kg	ug/ka	us/ks	112/53	119/1
ng (F	na/ka	ua/kā 26-Apr	06-May	06-1137		E-NPT	78-Art 27	-1177
ate of Sulmission		20-AD2 18-36*	3-5	13-15	7.5-19	U-15.	16-36.	
ept h		ן טר – או	,- J	ם ב	D	6	C	ı
	t)	5	5	;; \$	5	5	ż	ŀ
oil (S)/Water (W)/Sediment (X)	5							
		I -OUANT	ITATIVE)	CONTINU	C1)			
ASE/NEUTRAL/ACID EXTRACTIBLES, AUDITIONA	R LEVKS (SEU	,-00,000					1111	***
	ND	ND	2,080	ND	918	1117	1211	11
erhyl-ethyl phenols	NÜ	Nt	NII	3,920	NO	1117	***	11
but methy! ethy! phenois	110	HĐ	· ND	. 111	6o¢	111,	1.750	į.
intlivi-methyl-ethyl benyense	ND	ND	117	141)	ทย	1117	1111	
iot by I - napht ha Lene	PED.	ND	Nti	NI	ND .	יונו	4. PnS	11
Lakertanennut benzenes	ND	ND	1910	ND	1117	111,	1217	11
lacted had englitecatively to trans	9813	ND	ND	NU	Ni	1311	1315	18
tanaman i beizamite	NI)	1111	ND	2,890	ND	1117	HE	t,
Phosphoric acid, triphenyl ester	ND	ND	ND	111)	NI	ND	4.700	T.
Propy   Improper	131)	GN	ND	1113	ND	927	#ID	*
retrach larobipheny ls		HĎ	ND	ND	1117	1217	. titi	1
Tetradecanoic acid	MD	NÜ	57,700		ND	111)	4,250	1
Tot ramet by 1 - herizelies	131)	ND	ND.	1117	1117	1415	(iii)	t
Tetramethy! buty! phenois	. ND	,	ND	110	7117	ND	. 110	
Trich) onethene	111	1,530		• • •	ND	491	20.410	1
Trimethy) benzenes	. ND	ИÐ	ND		1110	1210	HD	t
Trimethy! naphthalenes	ND	ND	NU		2.490	ND	iiD	t
Trimethyl phenola	ĦŬ	ND	2,590			740	26,000	
Xi fenez	หบ	ND	98.900	9.370	1.050			
V. I Euro				<b></b>				
PCR								
PRIORITY POLISITARITS			. NT	) HÓ	ND	11b	m,	
Aroclor 1242	ND J	1 79	J1 81	f .		5.30031	50,000	۱ ۱
Aroclar 1254	200 J			, 140				
VEDETUL 1854	J	i	J1		$1.00^{\mathrm{Jl}}$	5.300 <sup>31</sup>	50, 000 <sup>J</sup>	
Tetals	500	79	J1 C	ס ס	1.100	3.30	30,000	
HETALS		reg/kc	mig/ks	- we/ke	mg/kg	ma/ka	ms/ks	110
INITS	eg/kç							
PRIORITY POLISITANTS	<del></del>				Nt:	5.20	6.70	2.
Antimony	C. 90	0.20				14.90	7.70	2.
Visionic	4.50	3.75		•		C.32	6.49	
	0.16	0.14				6.90	12	
Beryll itm	C. 45	131			-	130	200	2.
Codmium	7 ë	ş.90				250	355	Ē.
Chromism	79	2:	4.8				1,980	-
Collies	. 43	4:				1,060		
Lead	2.39	C. 1	1.3			2.00	130 57	
Hereury	7.40	5.29	. 4			25	•	
Hickel	431.	N	3.9	r 7.3	ु शह	6.60	٠.٠٠	
Selenium				· ·				

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TABLE 7 SUMMARY OF AREA C CHEMICAL ANALYSIS RESULTS

Sample & Units Date of Submission Depth Composite/Discrete Soil (S)/Water (W)/Sediment (X)	M1194 ug/kg 26-Apr 0-18" D S	M1195 uq/kq 26-Apr 18-36* D S	M1203 ug/kg 06-May 3-5' D		M1206 ug/kg 06-May 17.5-19 D S	M1207 ug/kg 26-Apr 0-18" C S	r:120F ug/kg 26-Apr 16-36" C	M1217 Ug/1 27-May I' W
METALS, PRIORITY POLLUTANTS CONTINUED UNITS	mg/kg	mā/kā	mg/kg	mg/kç	mą/kg	mā/kā	mc/ka	uş/L
# i loom	0.18	0.11	ND	HD	ND	1.10	0.99	. HD
Silver . Thallium	0.43	2.30	ŔĎ	ND		0.33	0.33	HĽ
Zinc	67	49	18.00	3.70	ND	705	2,200	69.00
Totals	172	137	2.822	365	91	2.213	4,898	106
PESTICIDES								
PRIORITY POLLUTANTS								
Beta-BHC	ND	ND	ND	ND		ND	KD	
4.4'-DDE	ND	ND	МD	ND		ND	ND	
4.4'-DDD	ND	ND	ND	ND		ND	ND	
Endosulfan sulfate	ND	ND	ND	ND		ND	ND	
Endrin aldehyde	ИD	ND	ND	ND	, ND	ND	ND	ND
Totals	. 0	0	. 0	O	0	0	0	0
PHENOLICS & CYANIDE	والمراجعة والمعارضة	, , , , , , , , , , , , , , , , , , ,						
Units	mg/kg	mg/kg	mg/kg			mg/kg	mg/kg	
Phenolics, Total	0.11	0.12	0.40			0.62	0.47	
Cyanide. Total	1.80	0.69	0.90	0.50	<.05	2.60	8.80	0.08

The randomness of these results indicates that the current site operations might not be the major source of contamination. Previous land-use (see Section 2.4) activities may have been caused by subsurface contamination that was then covered with fill of questionable cleanliness. This makes it impossible to discern target-to-source relationships or to infer that contamination is defined by the existing boundaries of Bayonne Barrel and Drum.

#### Area C

The soil samples in Area C, as in Areas A and B, had concentrations that exceed the BISE cleanup criteria for volatile organic, heavy metals and PCBs, plus high levels of acid extractable organics, phenolics, and a variety of base/neutral organics. See Table 7 and Figure 4 for the results of the analyses.

Composite sample M1208 (18-36") had the highest level of VOAs with a total concentration of 2,351.7 mg/kg, whereas M1207 (0-18") had less than 12 mg/kg. These results include the non-priority pollutant VOAs.

The three soil samples from monitoring well #2 (M1203, M1205 and M1206) also had total VOAs exceeding the 1 mg/kg cleanup level. The 3-5' sample (M1203) had 11 mg/kg, while the samples from 13-15' and 17.5-19' had VOA total concentrations of only 1-2 mg/kg. All three samples from well #2 also had high acid extractable organic concentrations that decreased with depth. The two main parameters were 2, 4-dimethylphenol and phenol, while total phenolics in sample 1205 (13-15') measured at 1,700 mg/kg.

Heavy metal concentrations in the first two soil samples from monitoring well #2 exceeded BISE cleanup levels for lead and mercury. The lead concentration was significantly less for the 13 to 15 foot sample (M1205) than for the 3 to 5 foot layer (M1203) and both lead and mercury totally absent from the 17.5 to 19 foot sample (M1206). The mercury concentrations were not significantly different from sample M1203 (1.3 mg/kg) to sample M1205 (1.9 mg/kg).

The composite soil samples (M1207/M1208) had excessive levels of cadmium, chromium, copper, mercury, lead and zinc. Lead concentrations ranged from 10 to 20 times the cleanup level of 100 mg/kg. In contast to the monitoring well soil samples the composite samples had higher metal concentrations in the lower sample interval (18-36 inches) than for the surface soil sample (0-18 inches). Though both composite samples are above the uppermost monitoring well soil sample. Since compositing does not allow for relating a specific sample to a contaminant source it can be safely proposed that like the rest of the site, metal contamination is from leaching of the ash pile and runoff from the drum storage area.

The metal contamination does not appear to have migrated below the water table to any great extent but not enough evidence is available to discern a concentration decrease with depth relationship. As groundwater on the site

did not possess excessive levels of metals it can be inferred that the metals are tightly bound to the sediment under existing pH and redox (reduction/oxidation) conditions.

Base/neutral organic concentrations were equally as high as elsewhere in the study area, but with some differences. The phthalates especially bis(2-ethyhexyl)phthalate, were greater than 6 mg/kg in sample M1203 (3'-5'), not detectable in sample M1205 (13'-15'), but at 17.5'-19 their concentration rose to 1.5 mg/kg. Also for the composite samples M1207/M1208, the upper composite (0-18") has a bis(2ethylhexyl) phthalate concentration of 4.6 mg/kg and a lower composite (18-36") concentration of 411 mg/kg.

Discrete samples M1194/M1195 were conspicuously void of high concentrations of contaminants found in the other Area C samples. Except possibly for the base/ neutral organic, methyl benzene, there were no other contaminant levels of concern even heavy metals. Samples M1194/M1195 were obtained farther south than any other discrete samples, and are upgradient from both the ash and tire piles and the runoff from the drum storage area.

PCBs exceeded clean-up levels for both the upper and lower depth intervals of composite samples M1207/M1208, with the lower sample being almost ten times higher in concentration than the upper (50 mg/kg vs. 5.3 mg/kg).

#### 4.2 Groundwater

The water samples collected on May 27, 1986 from monitoring well #2 and 3 were analyzed for Full Priority Pollutants Plus Forty. The BISE cleanup levels for groundwater, as presented in Table 4, are much stricter than for soil. This is because mobility for off-site contamination is much greater for groundwater than for soil, and the pathways for the water's uptake by fauna and flora, is more efficient.

#### Area A

Monitoring well #3 in Area A does not exceed the cleanup levels for any parameter.

#### Area B

There was no monitoring well located in Area B.

#### Area C

The results of monitoring well #2 are in sharp contrast to those of monitoring well #3. MW #2 contained excessive levels of volatile organics, acid extractable organics, and total phenolics. The volatile organic fraction was derived mainly from xylene; 4-methyl, 2-pentanone; and toluene, all of which are solvents in industrial applications and components in the

refinery of petroleum products. Taking the additional non-priority pollutant peaks into consideration greatly increases the total concentration of volatiles. The total concentration of both priority and nonpriority pollutants was over 98 ug/l, far in excess of the 10 ug/l cleanup level.

The total acid extractable organics concentration was 1,737 ug/l, with 2,4-dimethylphenol and phenol being the only contributors. Again, this far exceeds the cleanup level of 50 ug/l.

Total phenolics which is measured by a different method than for acid extractable phenols, was 16.3 mg/l. The criteria for this compound and most of the heavy metals and pesticides is established by the Bureau of Groundwater Quality Management in N.J.A.C. 7:9-6(c) and are presented in Table 4.

The groundwater quality criteria are applicable to the groundwater of the study area because the total dissolved solids concentration is between 500 mg/l and 10,000 mg/l, which is the main criteria for classifying groundwater. Conductivity measurements listed in Table 3 indicate total dissolved solid concentrations in this range. The Brunswick Shale is the primary aquifer underlying the site and has been subjected to a wide variety of contamination from industrial sources, infiltration of urban runoff, salt-water intrusion and reductions in recharge. Additionally, the Passaic River has also been subjected to upgradient sources of contamination that infiltrates the Brunswick Shale Aquifer and also receives discharge from the aquifer due to tidal affects. This pervasive pollution may result in the BISE deciding not to subject this portion of the aquifer to the cleanup guidelines listed in Table 4. No formal declaration of such an exclusion has been made public at the time of writing.

The results of the groundwater analyses do not exhibit pervasive on-site contamination. Monitoring well #3 is uncontaminated while monitoring well #2 has fairly high concentrations of phenolic compounds and volatile organics. This indicates that the sources of contamination are upgradient of monitoring well #2, (i.e., the old ash pile, drum storage area, tire pile, and other off-site sources) and that groundwater flows generally eastward instead of northeastward. Monitoring wells #2 and #3 had very similar water levels (3.67 and 3.72 feet, respectively), which made it impossible to delineate a hydraulic gradient, especially since the data has not-been corrected for tidal influences. A larger number of measurements needs to be made during low and high tides to correct for tidal affects. If measurements indicate the same hydraulic heads (water levels), then it is likely that groundwater passing through monitoring well #2 does not flow near monitoring well #3.

It is also apparent that many of the pollutants in the soils have not mobilized to the groundwater, especially the base/neutral extractable organics, heavy metals and PCB fractions. Volatile organics, being a mobile group of chemicals, are detected in the groundwater but not nearly at the levels found in the soil. The reason for this may be that the more mobile, water soluble constituents have already been flushed out of the soil, as the contamination has been deposited there over many years. The less water soluble substances, such as the base/neutral extractables and PCBs are not

mobile and have partition coefficients that do not permit phase changes from soil to water at any discernable concentration. The immiscible (insoluble in water) chemicals are more tightly bound to the sediment where they accumulate over time at high concentrations. As previously mentioned in Section 4.1 the metals also appear tightly bound to the sediment and not mobilizing into the water column.

The contamination found in the lower soil layers (below the surface) indicates that historical sources are a major contributor, and that the low levels found in the groundwater are not due to the lack of time needed for the above ground sources of contamination (drums, storage tanks, ash pile) to leach to the water table. This does not necessarily reduce the magnitude of existing on-site sources, but it does express the need for a more regional and historical explanation of the contamination.